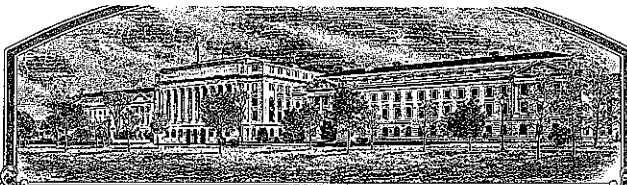


No.

200100091



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

University of Arkansas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE VARIETY. 4 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'CAVINESS'

In Testimony Whereof, I have herunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this third day of December, in the year two thousand one.

Attest:

Paul M. Jacobson

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Arthur C. Freeman


Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

The following state parts are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

1. NAME OF OWNER University of Arkansas Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME R93-171	3. VARIETY NAME Caviness
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Agricultural Food and Life Science Building Room 217 Fayetteville AR 72701		5. TELEPHONE (include area code) 501-575-6884	FOR OFFICIAL USE ONLY PVPO NUMBER 200100091 FILING DATE 2/03/2001
		6. FAX (include area code) 501-575-7465	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) University, State Institution	8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Don Dombek Department of Crop, Soil, and Environmental Sciences University of Arkansas 115 Plant Science Building Fayetteville, AR 72701			FILING AND EXAMINATION FEES: \$ 2705.00 DATE 2/2/2001 CERTIFICATION FEE: \$ 320.00 DATE 9/4/01
11. TELEPHONE (Include area code) 501-575-6884	12. FAX (Include area code) 501-575-7465	13. E-MAIL ddombek@uark.edu	14. CROP KIND (Common Name) Soybean
15. GENUS AND SPECIES NAME OF CROP Glycine max (L.) Merr.		16. FAMILY NAME (Botanical) leguminoceae	17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input checked="" type="checkbox"/> YES (if "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (if "no," go to item 22) 20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO 21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input checked="" type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED	
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER 		SIGNATURE OF OWNER	
NAME (Please print or type) Greg Weidmann		NAME (Please print or type)	
CAPACITY OR TITLE Interim Dean	DATE 1/26/01	CAPACITY OR TITLE	DATE

INSTRUCTIONS

200100091

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,450 (\$300 filing fee and \$2,150 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvp.htm>

ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) evidence of uniformity and stability; and (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (seed of this variety be sold by variety name only, as a class of certified seed), the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.
22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

February 9, 2000, in the United States of America.

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center-East, Beltsville, MD 20705. Telephone: (301) 504-8089.

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRM, AG Box 7630, Jamie L. Whitten Building, Washington, D.C. 20250. When replying, refer to OMB No. 0581-0055 and form number in your letter. Under the PRA of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-2791. To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal opportunity employer.

5&T-470 (6-98) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (03-96) which is obsolete.

2

Exhibit A: Origin and Breeding History

1. Caviness is derived from a cross of Asgrow Seed Company A5403 x Hutcheson¹. A5403 is derived from a cross A5474 x X4521. A5474 is derived from a cross of J74-122 and a breeding lines derived from the cross of Tracy²//Tracy/D71-6234. The pedigree of J74-122 is Forrest³*2//D68-18/PI88788. The pedigree of D68-18 is Dyer⁴/Bragg⁵. The pedigree of D71-6234 is PI95960/D66-7398. The pedigree of D66-7398 is D49-2491*2/PI96035. The pedigree of D49-2491 traces back to two ancestral lines, CNS and S100. X4521 was derived from a cross of Williams⁶ x Columbus⁷. The F₁ was grown in the summer of 1990 in Fayetteville, Arkansas. F₂ seed was bulked and advanced to the F₃ generation by modified single-seed-descent during the winter of 1990-91 in Belize, Central America. The F₃ generation was grown during the summer of 1991 at Fayetteville and F₄ seed was obtained by modified single-seed-descent. The F₄ population was grown in Fayetteville during the summer of 1992 and F₅ families (F₄:5) were generated via random selection. The F₄:5 families were grown at the Rice Research and Extension Center, Stuttgart AR, during the summer of 1993 and Caviness was bulked from a single F₄:5 row (row 171). [References 1. Crop Sci. 28:1024, 2. Crop Sci. 14:777, 3. Crop Sci. 13:287, 4. Crop Sci. 8:402, 5. Crop Sci. 4:664, 6. Crop Sci. 12:716, 7. Crop Sci. 12:396]

2. Caviness was tested as an F₄:6 bulk in the University of Arkansas Preliminary trials in 1994 at the Northeast Research and Extension Center (NEREC), Keiser AR, and the Rice Research and Extension Center (RREC) at Stuttgart AR. From 1995 to 1997 it was evaluated in the UA advanced strains trials conducted at NEREC (Kei.), RREC (Stu.), Pine Tree Branch Station in Pine Tree AR (Ptr), Cotton Branch Station at Marianna AR (Mar), and the Southeast Branch Station at Rohwer AR (Roh.). In 1997, Caviness was also entered in the University of Arkansas Commercial Cultivar trials conducted by Mr. Don Dombek and in the Mississippi Commercial Cultivar trials conducted by Mr. Joe Askew of the MAFES. The University of Arkansas commercial trials are conducted in southwest AR as well as the AR sites listed above. The Mississippi trial is conducted at four delta-region locations and four hill-region locations each year. Caviness was also evaluated in the USDA Uniform trials from 1996 to 1997. Caviness has been evaluated for yield at a total of 69 environments.

In each series of tests, Caviness was evaluated for yield, height, lodging, and maturity both across all locations and within individual test sites. Selection was based on yield potential, maturity, height, and general agronomic value.

A seed increase of Caviness was initiated in 1996. The seed has been increase in each successive year. In 1996, seed was obtained from 1995 yield plots and 1/6 acre was planted in Fayetteville, AR. This plot was rogued extensively for flower color, pubescence color, maturity, and height variants. Seed was harvested from this plot and used to plant a one acre plot in 1997 at the RREC. This plot was also extensively rogued and harvested. This seed was used to plant nearly 15 acres of Caviness in 1998. This field was also rogued. Seed from this field was harvested and used to produce foundation seed in 1999 at RREC and PTR.

3. Caviness has been observed for seven generations of testing and seed increase and is stable for its distinguishing characteristics (see exhibit C). The seven generation were: F4:6 bulk (1993), F4:7 (1994), F4:8 (1995), F4:9 (1996), F4:10 (1997), F4:11 (1998), F4:12 (1999). Caviness may have up to 1% off-types. These include imperfect black hila, black hila, purple flowered, and tawney pubesced individuals. In addition, height variants (2 to 5 inches) may be noted within a uniform field of Caviness inches.

Table 2. Performance of Caviness in the 1995, 1996, and 1996 University of Arkansas advanced group V trial. Means are presented across five irrigated test sites in each year. An LSD was used to test the significance of the difference between the means of Caviness and Hutcheson. The LSD value was calculated using data from only Caviness and Hutcheson. The genotype x location mean square was used as the error mean square. The five tests that were used to obtain the average for each year were planted at Keiser, Marianna, Pine Tree, Stuttgart, and Rohwer AR each year. Plots at all locations except Keiser consisted of 4 rows, each row being 16 foot long at harvest, with rows being from 30-38 inches apart. Plots at Rohwer consisted of five rows, each being 20 foot long at harvest and each being 19 inches apart. Two replications were used at each location and all plots were irrigated and planted between mid-May and the first week of June. Thus each comparison is based on 10 observations. Plots were typically harvested in mid-October. Plant height was measured at maturity on one typical plant per plot. Seed weight was determined from 100 random seeds sampled from the seed harvested from each plot.

	Height (inches)			Seed size (gms per 100 seeds)		
	1995	1996	1997	1995	1996	1997
CAVINESS	30	31	28	13.6	13.4	12.3
HUTCHESON	28	29	25	13.0	13.2	11.6
Cav - Hutch	2	2	3	0.6	0.2	0.7
LSD(0.05)	2.1	1.7	2.0	0.5	0.6	0.6
# environments	5	5	5	5	5	5

Exhibit B: Statement of Distinctness.

Caviness is most similar to Hutcheson and A5403, which are the parents of Caviness. Caviness has white flower, gray pubescence, ovate leaves, and a determinate growth habit like Hutcheson. Caviness is also similar to A5403, which has gray pubescence, ovate leaves, and a determinate growth habit, but A5403 has purple flowers while the flowers of Caviness are white. Based on 24 SSR markers that were polymorphic between A5403, Hutcheson, and Caviness, Caviness was different from A5403 at 9 markers; Caviness was distinct from Hutcheson at 14 markers (Table 1).

Table 1. Genotype at 24 SSR marker loci of Caviness and its parents, A5403 and Hutcheson.

Marker	Band size in base pairs		
	Caviness	Hutcheson	A5403
GMABAB	161	161	150
Sat_085	176	176	204
Sat_088	150	130	150
Sat_133	222	222	253
Satt095	173	170	173
Satt139	230	230	183
Satt152	235	252	235
Satt175	173	176	173
Satt180	246	246	270
Satt195	195	192	195
Satt245	199	216	199
Satt256	240	229	240
Satt288	224	224	249
Satt294	251	251	289
Satt306	236	231	236
Satt311	183	183	195
Satt369	253	119	253
Satt371	249	273	249
Satt373	286	249	286
Satt385	266	266	306
Satt414	313	267	313
Satt536	162	166	162
Satt561	249	242	249

In the University of Arkansas multi-location yield trials conducted in 1995, 1996 and 1997, Caviness is on average 2 inches taller than Hutcheson (Table 2). This difference ranged from 2 to 3 inches in the three separate years (Table 2). The seeds of Caviness were significantly larger than the seeds of Hutcheson, weighing on average 0.5 grams per 100 seeds more than Hutcheson (Table 2). This difference ranged from 0.2 to 0.7 in the three separate years (Table 2). Details of these trials and statistics are given in Table 2.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact the USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (*Glycine max* (L.) Merr.)

NAME OF APPLICANT(S) University of Arkansas Agricultural Experiment Station	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) Agricultural Food and Life Sciences Building Room 217 Fayetteville, AR 72701	PVPO NUMBER 200100091
	VARIETY NAME Caviness
	TEMPORARY OR EXPERIMENTAL DESIGNATION R93-171

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below.

Place a zero in the first box (e.g.,

9	9	9
---	---	---

 or

0	9
---	---

) when number is either 99 or less or 9 or less respectively. Data for quantitative

plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal

Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used:

Please answer all questions for your variety; lack of response may delay progress of your application.

A. MORPHOLOGY

Seed Shape:

<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>2</td></tr></table>	2	1 = Spherical (L/W, L/T, and T/W ratios < 1.2)	2 = Spherical-Flattened (L/W ratio > 1.2; L/T ratio < 1.2)
2			
	3 = Elongate (L/T ratio > 1.2; T/W ratio < 1.2)	4 = Elongate-Flattened (L/T ratio > 1.2; T/W ratio > 1.2)	

Seed Coat Color:

<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td></tr></table>	1	1 = Yellow	2 = Green	3 = Brown	4 = Black	5 = Other (Please Specify) _____
1						

Seed Coat Luster:

<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td></tr></table>	1	1 = Dull	2 = Shiny
1			

Seed Size:

<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>1</td><td>4</td></tr></table>	1	4	grams/100 seeds
1	4		

Hilum Color:

<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>7</td></tr></table>	7	1 = Buff 6 = Black	2 = Yellow	3 = Brown	4 = Gray	5 = Imperfect Black
7						
	7 = Other (Please Specify) <u>Buff</u>					

A. MORPHOLOGY (Continued)

Cotyledon Color:

1 = Yellow 2 = Green

200100091

Seed Protein Peroxidase Activity:

1 = Low 2 = High

Hypocotyl Color:

1 = Green 2 = Green with Bronze 3 = Light Purple 4 = Dark Purple extending to
('Evans' or 'Davis') Bands below Cotyledons below Cotyledons unifoliate leaves ('Hodgson',
('Woodworth' or 'Tracy') ('Beeson' or 'Pickett 71') 'Coker', or 'Hampton 266A')

Leaflet Shape:

1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other (Please Specify) _____

Flower Color:

1 = White 2 = Purple 3 = White with a Purple Throat

Pod Color:

1 = Tan 2 = Brown 3 = Black

Pubescence Color:

1 = Gray 2 = Brown (Tawny) 3 = Light Tawny

Plant Habit:

1 = Determinate 2 = Semi - Determinate 3 = Indeterminate 4 = Intermediate

Maturity Group:

<input type="text" value="0"/>	<input type="text" value="8"/>	1 = 000	2 = 00	3 = 0	4 = I	5 = II
		6 = III	7 = IV	8 = V	9 = VI	10 = VII
		11 = VIII	12 = IX	13 = X	14 = XI	15 = XII

Maturity Subgroup:

Please enter a value from 0 - 9

B. DISEASE REACTIONS

0 = Not Tested

1 = Susceptible

2 = Resistant

3 = Tolerant

Bacterial

Bacterial Pustule (*Xanthomonas campestris* pv. *glycines* (Nakano) Dye)

Bacterial Blight (*Pseudomonas syringae* pv. *glycinea* (Coerper) Young, Dye, & Wilkie)

Wildfire Blight (*Pseudomonas syringae* pv. *tabaci* (Wolf & Foster) Young, Dye, & Wilkie)

B. DISEASE REACTIONS (Continued)

0 = Not Tested

1 = Susceptible

2 = Resistant

3 = Tolerant

Fungal

200100091

Brown Spot (*Septoria glycines* Hemmi)

Frogeye Leaf Spot (*Cercospora sojina* Hara)

race 1

race 2

race 3

race 4

race 5

race 6

Other (Please Specify) _____

Target Spot (*Corynespora cassicola* (Berk. & Curt.) Wei)

Downey Mildew (*Peronospora trifoliorum* var. *manchurica* (Naum.) Syd. ex Gäum)

Powdery Mildew (*Microsphaera diffusa* Cke. & Pk.)

Brown Stem Rot (*Phialophora gregata* (Allington & Chamberlain) W. Gams.)

Stem Canker (*Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *caulivora* Athow & Caldwell)

Pod and Stem Blight (*Diaporthe phaseolorum* (Cke. & Ell.) Sacc. var. *sojae* (Lehman) Wehm.)

Purple Seed Stain (*Cercospora kikuchii* (T. Matsu. & Tomoyasu) Gardener)

Rhizoctonia Root Rot (*Rhizoctonia solani* Kühn)

Phytophthora Root Rot (*Phytophthora megasperma* Drechs. f. sp. *glycinea* (Kuan & Erwin))

race 1

race 8

race 15

race 22

race 2

race 9

race 16

race 23

race 3

race 10

race 17

race 24

race 4

race 11

race 18

race 25

race 5

race 12

race 19

race 26

race 6

race 13

race 20

Other (Please Specify)

race 7

race 14

race 21

Bud Blight (Tobacco Ringspot Virus)

Yellow Mosaic (Bean Yellow Mosaic Virus)

2001000911

Cowpea Mosaic (Cowpea Chlorotic Virus)

Pod Mottle (Bean Pod Mottle Virus)

Seed Mottle (Soybean Mosaic Virus)

Nematode

Soybean Cyst Nematode (*Heterodera glycines* Ichinohe)

<input type="text" value="0"/> race 1	<input type="text" value="0"/> race 4	<input type="text" value="1"/> race 9
<input type="text" value="1"/> race 2	<input type="text" value="1"/> race 5	<input type="text" value="1"/> race 14
<input type="text" value="2"/> race 3	<input type="text" value="0"/> race 6	Other (<i>Please Specify</i>) _____

Lance Nematode (*Hoplolaimus columbus* Sher)

Southern Root Knot Nematode (*Meloidogyne incognita* (Kofoid & White) Chitwood)

Northern Root Knot Nematode (*Meloidogyne hapla* Chitwood)

Peanut Root Knot Nematode (*Meloidogyne arenaria* (Neal) Chitwood)

Reniform Nematode (*Rotylenchus reniformus* Linwood & Olivera)

Javanese Nematode (*Meloidogyne javanica* (Treub) Chitwood)

Other Nematode (*Please Specify*) _____

C. PHYSIOLOGICAL RESPONSES 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

Iron Chlorosis on Calcareous Soil

Phosphorus Other (*Please Specify*) _____

Boron

Aluminum

Salt

Drought

D. INSECT REACTIONS 0 = Not Tested 1 = Susceptible 2 = Resistant 3 = Tolerant

Mexican Bean Beetle (*Epilachna varivestis* Mulsant)

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Potato Leaf Hopper (*Empoasca fabae* (Harris))

Other (Please Specify) _____

E. HERBICIDE REACTIONS 0 = Not Tested 1 = Susceptible 2 = Resistant

Metribuzin

Bentazone

Sulfonylurea

Glyphosate

Glufosinate

Pendimethalin

Other (Please Specify) _____

F. TRANSGENIC COMPOSITION

Has the development of the subject variety included the insertion of genetic material from an organism other than a soybean, or, the removal of genetic material from the application variety?

If yes, please complete the following information requests*. Use additional pages if necessary.

☐ S☒ X D

1. Please state the vector's name:

2. Please state the vector components:

3. Please describe the genetic material successfully transferred into the subject variety:

4. Please describe the insertion protocol:

* A literature citation(s) explaining the four information requests above may be an acceptable alternative to completion of the "Transgenic Composition" portion of this form.

G. BIOCHEMICAL MARKERS

Please describe any biochemical information here, which you believe will be helpful in further describing the subject variety (e.g. Simple Sequence Repeats, Restriction Fragment Length Polymorphisms, Isozymic Characterization). Use additional pages if necessary.

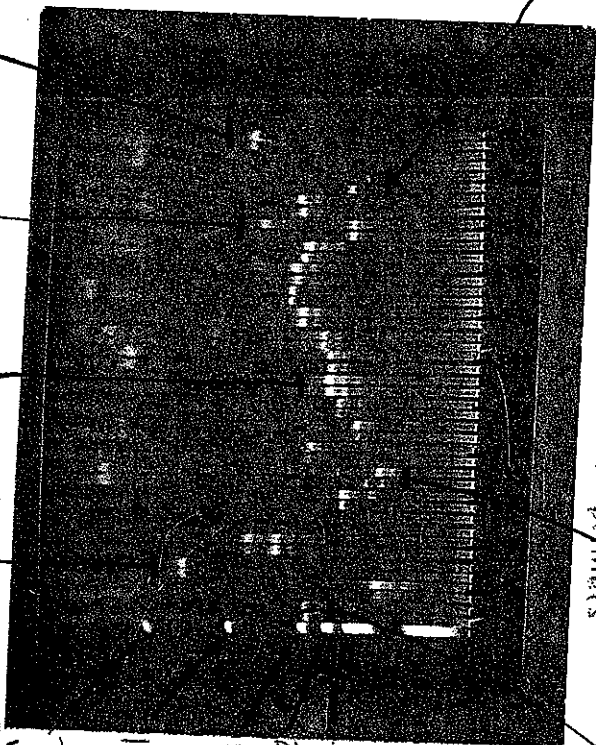
Caviness (R93-171) has been characterized with 209 soybean SSR primers (see attached sheet)

Attachment to Exhibit C of Caviness PVP application: Summary of 209 SSR markers used to characterize Caviness

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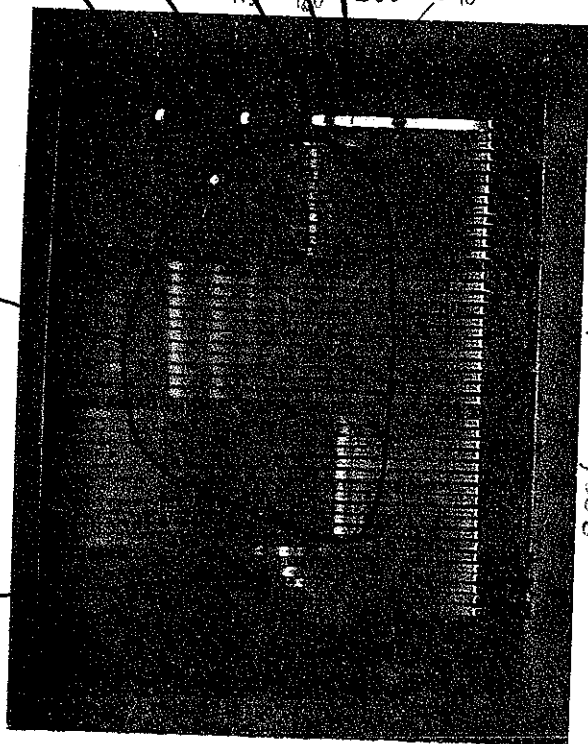
SSR Primer	Band size	SSR Primer	Band size	SSR Primer	Band size	SSR Primer	Band size
GMABAB	161	Satt181	198	Satt311	183	Satt495	247
GMENOD2B	167	Satt186	232	Satt312	163	Satt501	341
GMRUBP	131	Satt187	280	Satt315	244	Satt511	258
Sat_038	166	Satt188	236	Satt316	205	Satt513	114
Sat_042	138	Satt191	207	Satt318	268	Satt516	254
Sat_044	152	Satt194	247	Satt321	239	Satt522	237
Sat_074	257	Satt195	195	Satt326	230	Satt524	166
Sat_084	154	Satt196	190	Satt327	253	Satt531	240
Sat_085	176	Satt197	174	Satt329	266	Satt532	176
Sat_088	150	Satt199	159	Satt332	249	Satt536	162
Sat_089	172	Satt200	245	Satt335	252	Satt539	159
Sat_091	153	Satt201	288	Satt336	179	Satt541	175
Sat_094	278	Satt202	280	Satt339	234	Satt545	202
Sat_106	244	Satt207	239	Satt345	201	Satt548	208
Sat_118	200	Satt209	171	Satt346	212	Satt549	210
Sat_120	329	Satt212	154	Satt349	181	Satt551	229
Sat_121	193	Satt215	134	Satt354	251	Satt554	259
Sat_124	259	Satt217	256	Satt356	248	Satt559	189
Sat_130	287	Satt220	249	Satt357	215	Satt560	273
Sat_133	222	Satt224	161	Satt359	194	Satt561	249
Satt002	121	Satt225	106	Satt367	252	Satt563	165
Satt006	152	Satt232	263	Satt368	111	Satt571	128
Satt022	195	Satt233	202	Satt369	253	Satt588	169
Satt038	175	Satt234	217	Satt371	249	Satt590	316
Satt042	102	Satt235	135	Satt372	251	Satt593	187
Satt052	104	Satt237	255	Satt373	286	Satt597	155
Satt072	202	Satt239	195	Satt378	166	Satt598	172
Satt089	155	Satt243	212	Satt380	140	Satt599	185
Satt095	173	Satt245	199	Satt381	230	Sct_026	122
Satt102	151	Satt247	214	Satt384	149	Sct_064	146
Satt114	109	Satt249	252	Satt385	266	Sct_065	162
Satt117	144	Satt252	209	Satt387	201	Sct_186	251
Satt120	160	Satt253	151	Satt390	228	Sct_188	295
Satt128	280	Satt255	142	Satt394	274	Sct_189	255
Satt132	252	Satt256	240	Satt395	280	Sctt_008	90
Satt133	181	Satt259	202	Satt396	178	SOYGPATR	113
Satt139	230	Satt260	219	Satt405	305	SOYHSP176	117
Satt144	228	Satt262	246	Satt408	192	SOYLBC	176
Satt145	153	Satt263	233	Satt411	99		
Satt147	192	Satt267	230	Satt414	313		
Satt148	295	Satt268	248	Satt415	296		
Satt152	235	Satt269	256	Satt416	378		
Satt155	158	Satt270	225	Satt419	247		
Satt158	196	Satt271	113	Satt422	209		
Satt159	269	Satt273	284	Satt434	316		
Satt161	218	Satt277	177	Satt435	286		
Satt164	226	Satt280	231	Satt437	264		
Satt165	283	Satt285	206	Satt441	268		
Satt166	262	Satt288	224	Satt445	199		
Satt168	229	Satt290	235	Satt452	210		
Satt171	280	Satt293	207	Satt453	233		
Satt172	225	Satt294	251	Satt455	256		
Satt173	253	Satt300	238	Satt459	184		
Satt175	173	Satt302	256	Satt462	183		
Satt177	109	Satt306	236	Satt463	122		
Satt178	178	Satt307	173	Satt477	141		
Satt180	246	Satt309	126	Satt490	295		

Set 3



Set 16

Set 23



Size Standards
in base pairs (bp)

These lanes are not part
of the Caviness/TN5-85
comparison

Caviness is in the 1st (left) lane of each set. Primers used in each set are identified in Table 1 of 6/12/2001 letter

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) University of Arkansas Agricultural Experiment Station	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER R93-171	3. VARIETY NAME Caviness
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Agricultural Food and Life Science Building Room 217 Fayetteville, AR 72701	5. TELEPHONE (include area code) 501-575-6884	6. FAX (include area code) 501-575-7465
	7. PVPO NUMBER 000200100091	

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? ☒ YES ☐ NO
If no, give name of country

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (if needed, use reverse for extra space):

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

STD-470-E (07-87) (Destroy previous editions).

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